

## Description

# FASTENING STRUCTURE

### BACKGROUND OF INVENTION

[0001] 1. Field of the Invention

[0002] The invention relates to a fastening structure, and more particularly to a fastening structure mounted in a power control box.

[0003] 2. Description of the Prior Art

[0004] Electronic equipment usually has an adapter module for receiving signals and an electrical controller module for processing signals. In order to prevent the modules from being interfered by electromagnetic effects, the modules are placed in an enclosed power control box, which may cause problems in assembly. With respect to the yield and production cost, fast and easy assembly is important for improving the product competitiveness.

[0005] Referring to FIG. 1, signal receiving and transmitting circuits of a conventional adapter module 1, such as a tuner, are placed inside a rectangular box. At least one input

connector 2 is externally mounted on a wall of a rectangular box of the adapter module 1 to receive cable TV signals, digital signals or image signals, and the input connector 2 decides the position of the module 1 in a power control box 3. Referring to FIG. 2, a connecting hole 4 is formed through a wall of the power control box 3 to align with the connector 2. In assembly, the adapter module 1 is placed in the power control box 3, the input connector 2 is pushed into the connecting hole 4 and then a screw nut 5 is screwed on the connector 2 from outside of the power control box 3 to fasten the adapter module 1. During screwing of the screw nut 5, the adapter module 1 does not have any fastening structure to specifically fasten the adapter module 1. Therefore, the adapter module 1 tends to move in an opposite direction, causing difficulty for assembling the screw nut 5. Furthermore, the limited interior space and sidewalls of the power control box 3 block the user's angle of view for aligning the input connector 2 with the connecting hole 4.

## **SUMMARY OF INVENTION**

[0006] It is an object of the invention to provide a fastening structure that achieves easy and efficient assembly by means of guiding sheets and a resilient stopper.

- [0007] It is another object of the invention to provide a fastening structure that enables fast assembly of an adapter module in a power control box to increase the assembly efficiency.
- [0008] It is still another object of the invention to provide a fastening structure that allows easy screwing of a screw nut on an adapter module.
- [0009] In order to achieve the above and other objectives, the fastening structure of the invention includes at least two guiding sheets and at least one resilient stopper. The guiding sheets are oppositely mounted on the power control box to form a guiding path. The resilient stopper is mounted behind the resilient stopper. The resilient stopper has a fixed end and a free end facing the guiding sheets. After the adapter module is guided to a predetermined position, the resilient stopper rebounds to abut against and fasten the adapter module.

#### **BRIEF DESCRIPTION OF DRAWINGS**

- [0010] The drawings included herein provide a further understanding of the invention. A brief introduction of the drawings is as follows:
- [0011] FIG. 1 is an exploded view of a conventional adapter module and power control box.

- [0012] FIG. 2 is a schematic view of a conventional adapter module and power control box.
- [0013] FIG. 3 is a perspective view of a fastening structure according to a first embodiment of the invention.
- [0014] FIG. 4 is a schematic view of the operation of an adapter module fastening to a power control box according to a first embodiment of the invention.
- [0015] FIG. 5 is a schematic view of the operation of screwing a screw nut on an adapter module according to a first embodiment of the invention.
- [0016] FIG. 6 is a perspective view of a fastening structure according to a second embodiment of the invention.
- [0017] FIG. 7 is a schematic view of the operation of an adapter module fastening to a power control box according to a second embodiment of the invention.

#### **DETAILED DESCRIPTION**

- [0018] Wherever possible in the following description, like reference numerals will refer to like elements and parts unless otherwise illustrated.
- [0019] Referring to FIG. 3, a fastening structure of the invention is mounted inside a power control box 10. The fastening structure includes two guiding sheets 21 and a resilient stopper 22. The guiding sheets 21 are vertically mounted

on a bottom 11 of the power control box 10 to form a guiding path. The guiding sheets 21 are respectively spaced away from a sidewall 12 of the power control box 10 to prevent visual blocking by the sidewall 12 in assembly. Each guiding sheet 21 has a free end 211 bending toward each other, so that the inner sidewalls of the opposite surfaces of the guiding sheets 21 facing each other become guiding faces in assembly. The bending angle between the free end and a main portion of each guiding sheet 21 is about 90 degrees. The resilient stopper 22 is mounted behind the guiding sheets 21 in the guiding path. The resilient stopper 22 has one fixed end 221 mounted on the bottom 11 of the power control box 10, and a free end 222 protruding from the bottom 11 with an angle and facing the guiding sheets 21. When the free end 222 is pressed, the free end 222 is located at the same plane as the bottom 11 of the power control box 10. When the pressure is released, the free end 222 returns to its initial position.

[0020] Referring to FIG. 4, the fastening structure of the invention is used in assembling an adapter module 1 having two input connectors 2, i.e., a tuner. A connecting hole 13 is formed on a sidewall 12 of a power control box 10 for

receiving an input connector 2. Two guiding sheets 21 are oppositely mounted behind the connecting hole 13 to match the size of the adapter module 1, so that the input connector 2 can be inserted into the connecting hole 13. When the adapter module 1 is to be assembled, it is placed on the bottom 11 of the power control box 10 in a manner that an upper edge of the adapter module 1 is aligned with an inner sidewall (guiding face) of the guiding sheets 21. Thus, the adapter module 1 is guided to move along its X-axis while movements along the Y-axis and Z-axis are restricted, at this time, the adapter module 1 is urged against the resilient stopper 22. After the adapter module 1 is pushed into the connecting hole 13 via the input connector 2, the pressure applied on the resilient stopper 22 is released and the resilient stopper 22 rebounds to abut against a back surface of the adapter module 1 to restrict the movement of X-axis of the adapter module 1. Thereby, the adapter module 1 is fixedly assembled.

[0021] With the arrangement of the guiding sheets 21, the adapter module 1 is allowed to move along one axis. After the adapter module 1 is in place, the resilient stopper rebounds to abut against the adapter module 1 to fasten the

adapter module 1. Therefore, easy assembly with high efficiency is achieved. The guiding sheets 21 are spaced away from the sidewall 12, so that the alignment of the upper edge of the adapter module 1 with the inner sidewall of the guiding sheet is performed without the obstruction of the power control box 10. The adapter module 1 is therefore easily placed at the right positions. The resilient stopper 22 replaces a traditional screw nut, rendering the assembly much easier. Referring to FIG. 5, in order to further fasten the adapter module 1, a screw nut 14 is additionally screwed to the input connector 2 from the outside of the power control box 10. During screwing, the resilient stopper 22 and the guiding sheets 21 restrict the adapter module 1 not to move backward so as to easily screw the screw nut 14.

[0022] In another embodiment, only one guiding sheet 31 is used. Referring to FIG. 6 and FIG. 7, the fastening structure includes a guiding sheet 31 and a resilient stopper 32. The guiding sheet 31 has a reversed "L" shaped free end 311. The position of the guiding sheet 31 depends on the profile of the adapter module 1. The resilient stopper 32 is mounted behind the guiding sheet 31. The resilient stopper 32 has a free end 321 facing the guiding sheet

31. When the adapter module 1 is to be assembled, one upper edge of the adapter module 1 is aligned with an inner sidewall of the guiding sheet 31 and a sidewall 15 of the power control box 10 to guide the adapter module 1, and the resilient stopper 32 is pressed to be at the same plane as the bottom 11. After the adapter module 1 slides to a predetermined position, the resilient stopper 32 re-bounds to abut against a back surface of the adapter module 1 to fasten the adapter module 1.

[0023] It should be apparent to those skilled in the art that the above description is only illustrative of specific embodiments and examples of the invention. The invention should therefore cover various modifications and variations made to the herein-described structure and operations of the invention, provided they fall within the scope of the invention as defined in the following appended claims.